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Underwater Connectivity

‘P’ Electrical Connector
Subsea / Underwater / Marine

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Underwater Connectivity

‘P’ Electrical Connector Subsea / Underwater / Marine

Introduction:

CRE has developed a wide range of metal shell connectors over the years focussed on delivering high reliability in tough environments. They are designed for heavy duty use in the most rigorous underwater applications on the planet. The design offers a high integrity sealing arrangement, metal key-ways,multiple options,size,pin quantity,voltage and current rating along with our ability to design specific solutions for your application.

Manufactured as standard from stainless steel or custom built with any material specified, they come with high open face pressure resistance. The standard connectors are rated to 6000m WD and are designed for use in moulded, oil filled and PBOF, in power, signal, and electro-mechanical applications.

Common applications:

- ROV, Resident ROV & AUV
- Manned underwater vehicles
- Aquaculture
- Renewables
- Ocean science/research
- Dive / depressurisation systems

Key features:

- Up to 16 contacts
- Mixed contact sizing options
- Custom solutions (contact qty/size/type, glass to metal)
- Rated for 6000m WD mated and open face as standard, higher pressure available on application
- Oil filled (OF) available as standard, pressure balanced oil filled (PBOF) available for certain pin configurations (connector & bulkhead assemblies)
- Working voltage and current dependent on contact density and diameter.

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Underwater Connectivity

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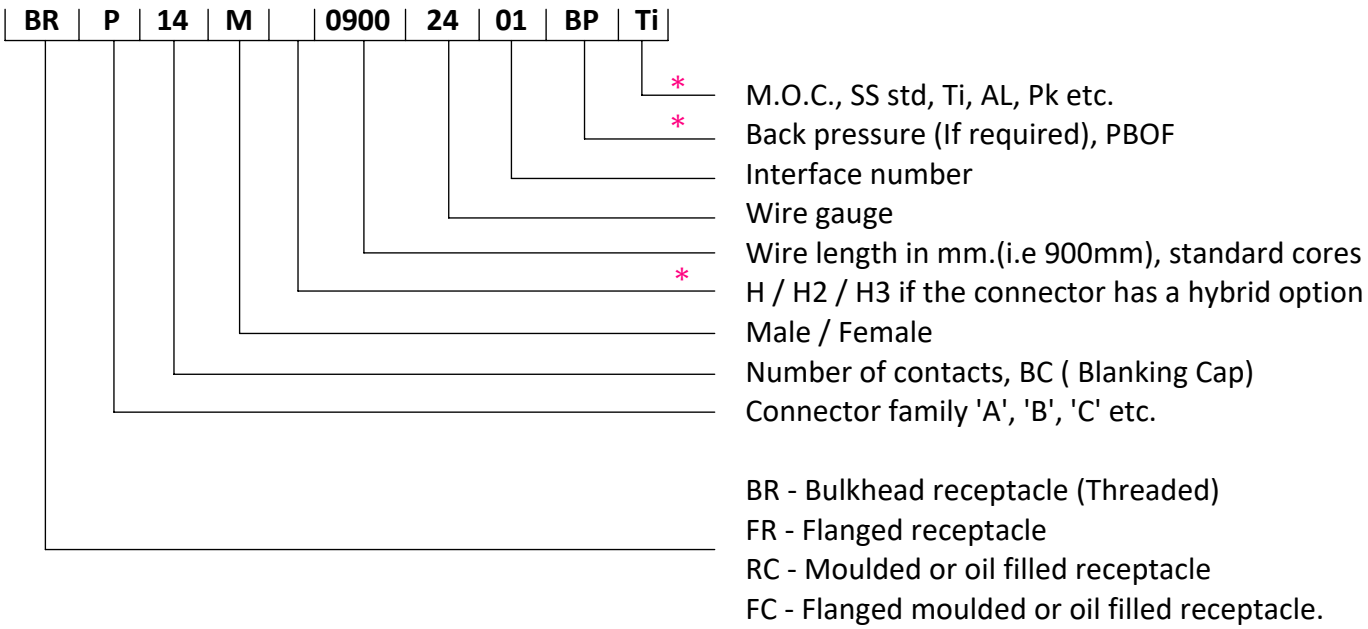
Part numbering:

Bulkhead example:



Notes:

1. For standard assemblies, the part number structure indicated * above is left blank.
2. Where custom wiring is required, Engineering will issue a BA**** (Bulkhead Assembly Part Number) to substitute for the wire length/gauge in the part number structure. For example, in the part nunber above 090024 would be replaced by BA followed by a four digit number to create a unique identifier.

Component	Material
Bulkhead Body	Stainless steel 316L standard
Contact Insert	Epoxy or Glass to Metal
Electrical contacts	Leaded Nickel Copper C(&or K41)
Plating detail	1um Acid Gold over 2.5 um Nickel Copper Flash
Retaining nut/washer (optional, order if req.)	Stainless steel
Flange retainers (optional, order if req.)	Stainless steel
'O' Rings	Nitrile NI70 or as specified by customer

Notes:

1. Contact CRE for any special-order materials required

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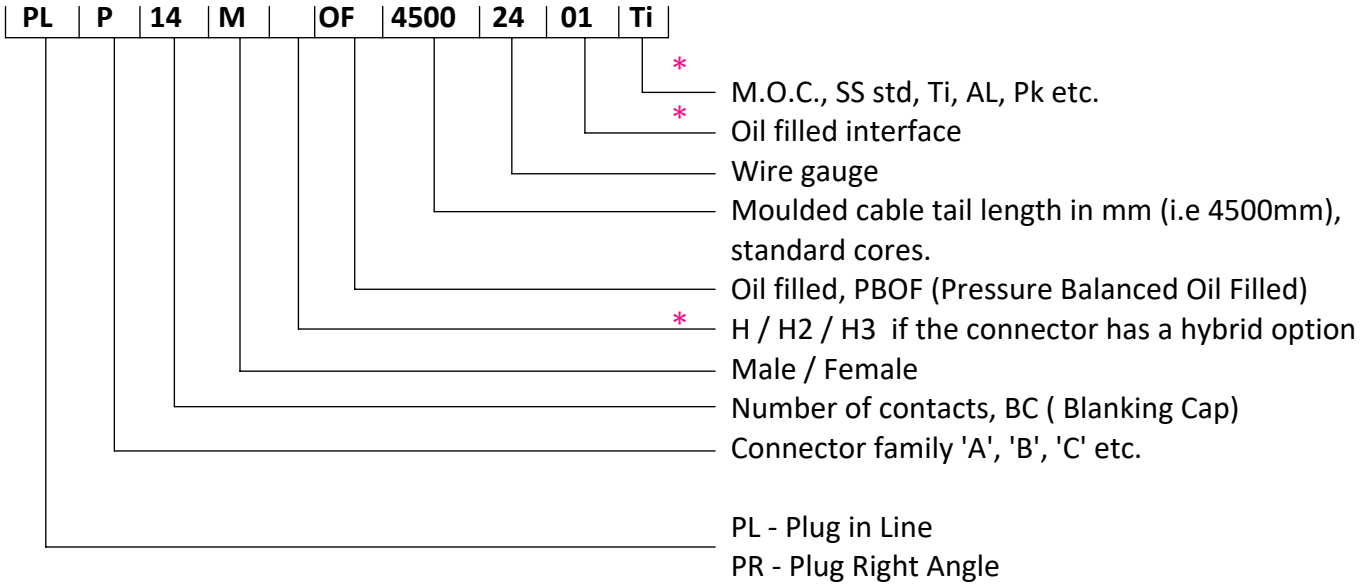
Subsea / Underwater / Marine

Part numbering:

Connector example:



Notes:

1. For standard moulded assemblies, the part number structure indicated * above is left blank.
2. Where custom wired moulded tail is required, Engineering will issue a CA**** (Connector Assembly Part Number) to substitute for the wire length/gauge in the part number structure. For example, in the part nunber above 090024 would be replaced by CA followed by a four digit number to create a unique identifier.

Component	Material
Connector Body	Stainless steel 316L standard
Locking Collar	Aluminium Nickel Bronze
Backing Washer	Acetal
Contact Insert	Epoxy or Glass to Metal
Electrical Contacts	Leaded Nickel Copper C(& or K41)
Plating detail	1um Acid Gold over 2.5 um Nickel Copper Flash
'O' Rings	Nitrile NI70 or as specified by customer

Notes:

1. Contact CRE for any special-order materials required

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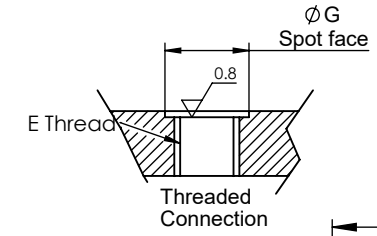
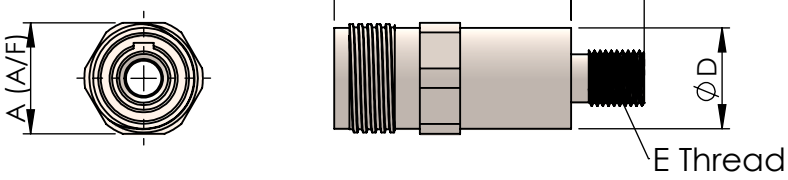
Underwater Connectivity

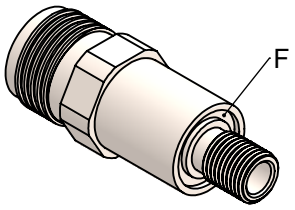
Reference Dimensions 'P' Connector

Threaded Bulkhead Connector Receptacle (BR)

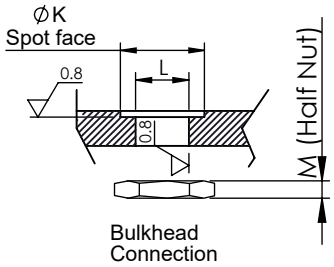


Interface Details

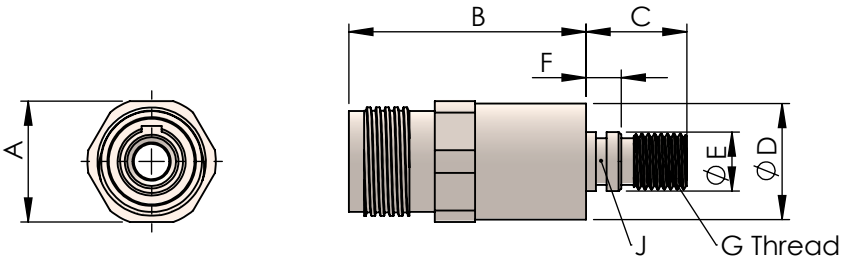


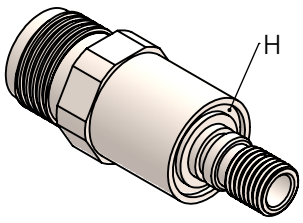


A	B	C	D	E	F-'O'Ring	G	TYPE
27	52	14	24	7/16-20 UNF	BS016	25	01
27	47	14	24	1/2-20 UNF	BS016	25	02
27	46	10	24	9/16-18 UNF	BS254	25	06
27	47	14	25.5	5/8-18 UNF	BS017	27	03
27	47	14	30	3/4-16 UNF	BS020	31	04
30	47	14	32	7/8-14 UNF	BS024	33	05



Interface Details





A	B	C	D	E	F	G	H-'O'Ring	J-'O'Ring	K	L	M	TYPE
24	33	28.5	27	17.4	9.4	5/8-24 UNEF	BS017	1.5 x 15	30	17.45/17.5	4	07

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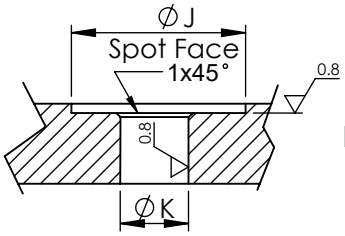
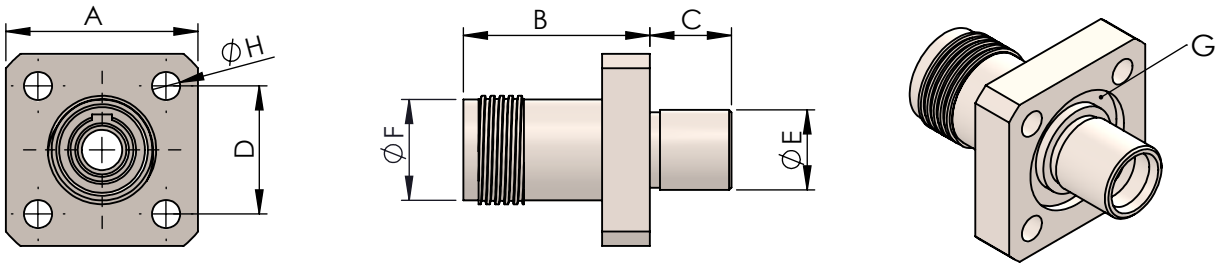
Underwater Connectivity

Reference Dimensions 'P' Connector

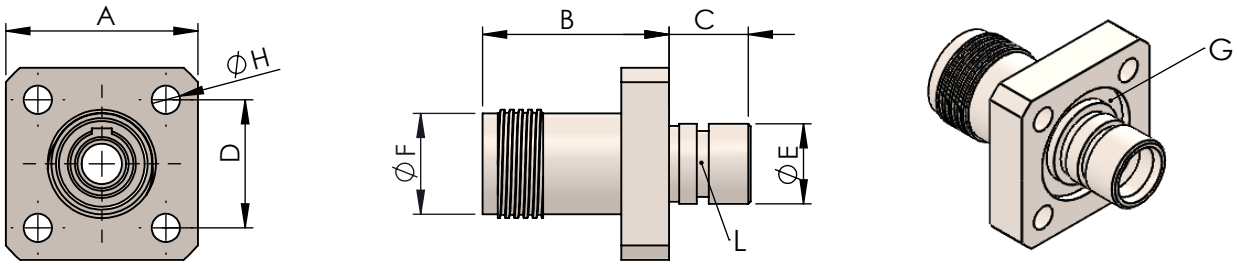
Flanged Bulkhead Connector Receptacle (FR)



INTERFACE DETAILS



A	B	C	D	E	F	G-'O'Ring	H	J	K	TYPE
30	30	14	22	17	24	20 x 1.5	3.8	42	17.15/17.2	01
31.75	30	10	22	17	24	20 x 1.5	3.8	45	17.15/17.2	02
36	36	12	25.4	17	24	BS019	5.6	50	17.15/17.2	03



A	B	C	D	E	F	G-'O'Ring	H	J	K	L-'O'Ring	TYPE
28.5	33	12.7	23	17.4	24	BS019	3.2	42	17.45/17.5	1.5 x 15	05
31.75	22.05	17.2	25.9	19	24	BS019	4.3	45	19.05/19.1	BS016	04

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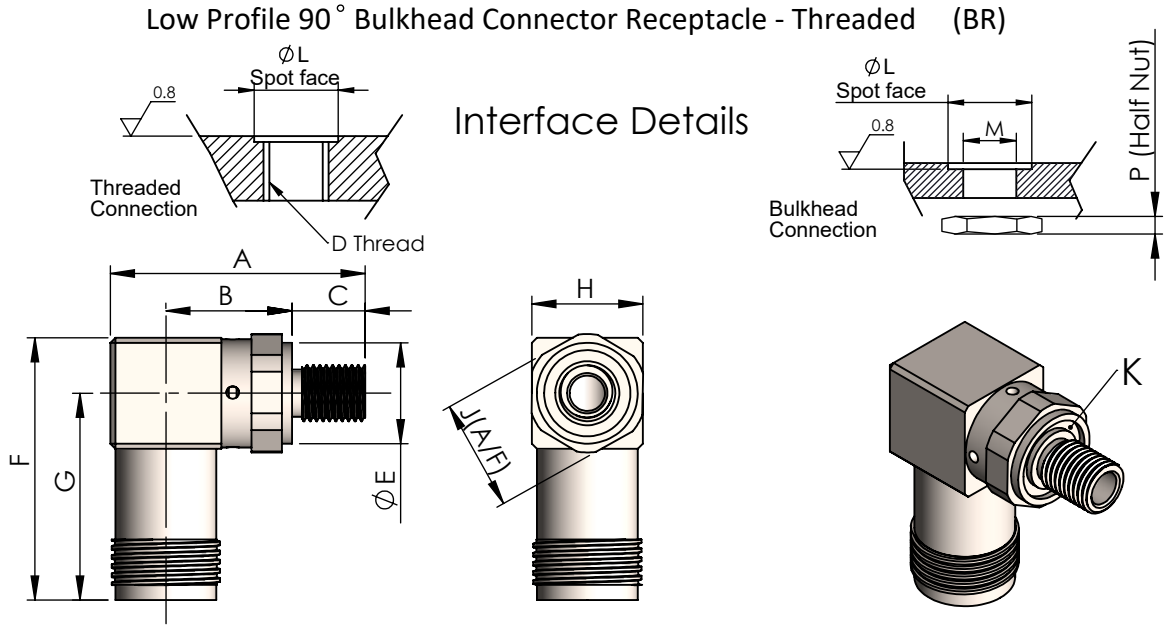
Underwater Connectivity

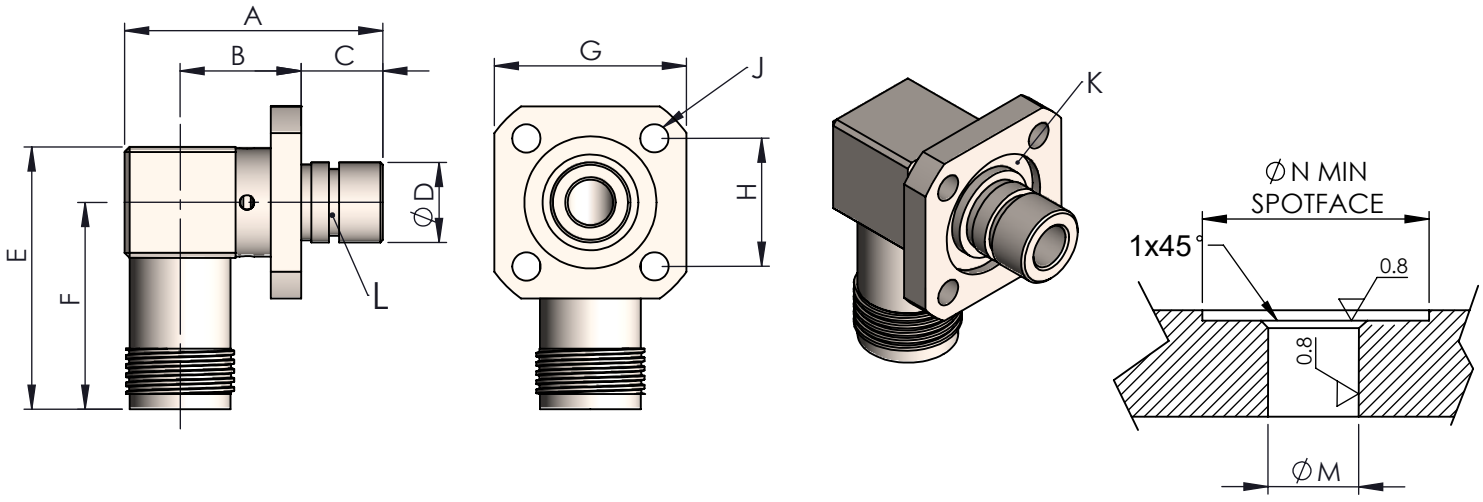
Reference Dimensions 'P' Connector

Low Profile 90° Bulkhead Connector Receptacle - Threaded (BR)



A	B	C	D	E	F	G	H	J	K-'O'Ring	L	M	P	TYPE
60	28	19	5/8-18 UNF	26	58	45	26	30	BS017	28	11/16	4	LPT01
51	28	10	5/8-18 UNF	26	58	45	26	30	BS017	28	11/16	N/A	LPT02

Low Profile 90° Bulkhead Connector Receptacle - Flanged (FR)



A	B	C	D	E	F	G	H	J	K'O'Ring	L'O'Ring	M	N	TYPE
52	27	12	17	58	45	36	25.4	5.6	BS019	N/A	17.05/17.1	50	LPF01
54.2	29	12.2	19	58	45	31.75	25.9	4.3	BS019	BS016	19.05/19.1	45	LPF02

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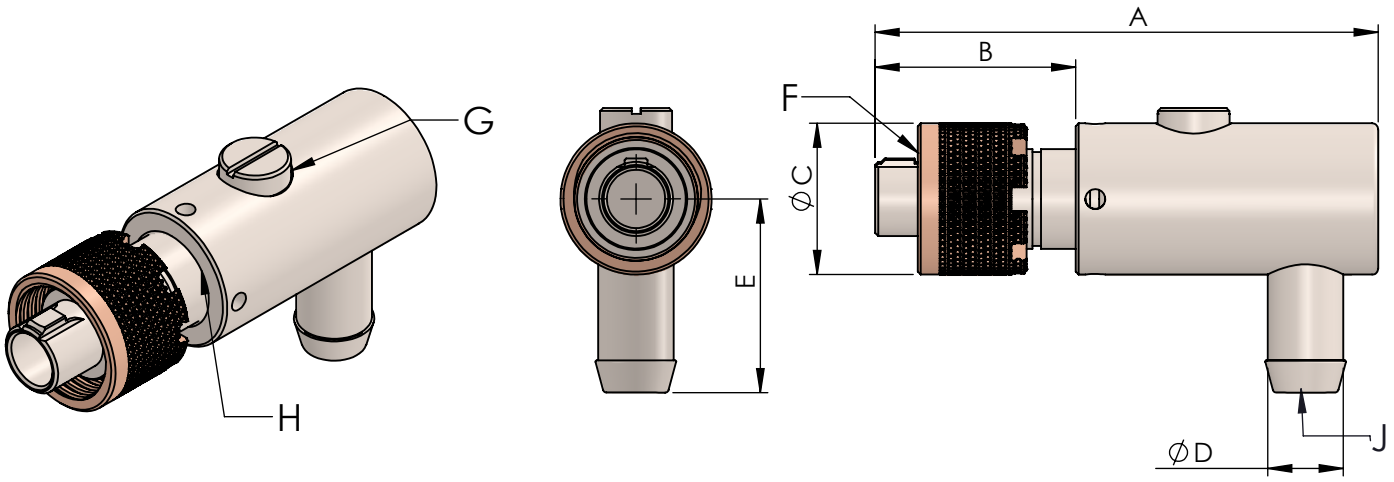
Underwater Connectivity

Reference Dimensions 'P' Connector

Backshell Cable Connector Receptacle-90 Deg. (PR)



A	B	C	D	E	F-'O'Ring	G-'O'Ring	H-'O'Ring	BORE J	TYPE
79.5	34.25	28	12.5	30.5	17.5 x 1.6	6 x 1.5	18.5 x 1.6	10	01

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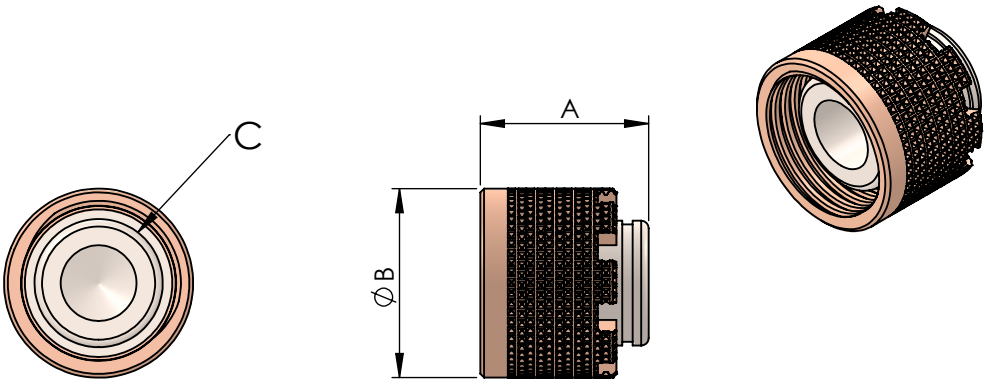
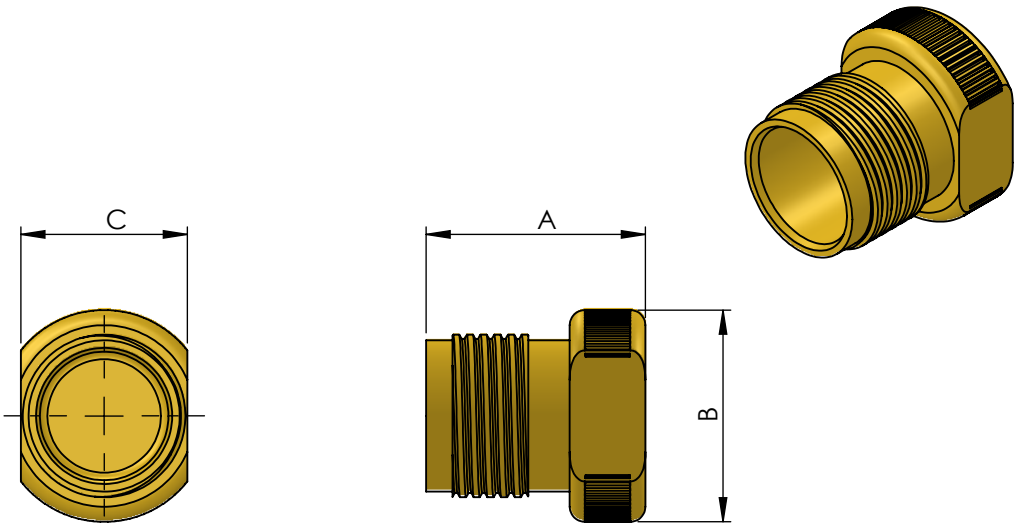
Reference Dimensions 'P' Connector

Bulkhead Blanking Plug - PLPBC



A	B	C-'O'Ring
21.5	28	16.76 X 1.63

Cable Connector Blanking Plug - BRPBC



A	B	C
29	36	28

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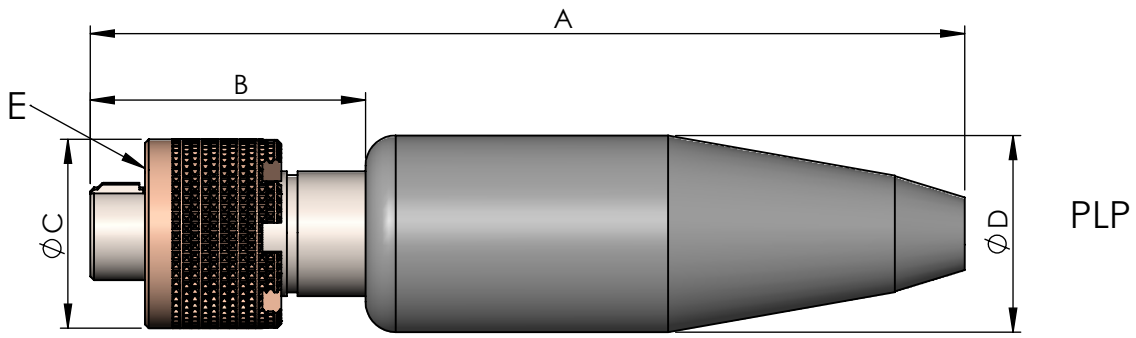
Underwater Connectivity

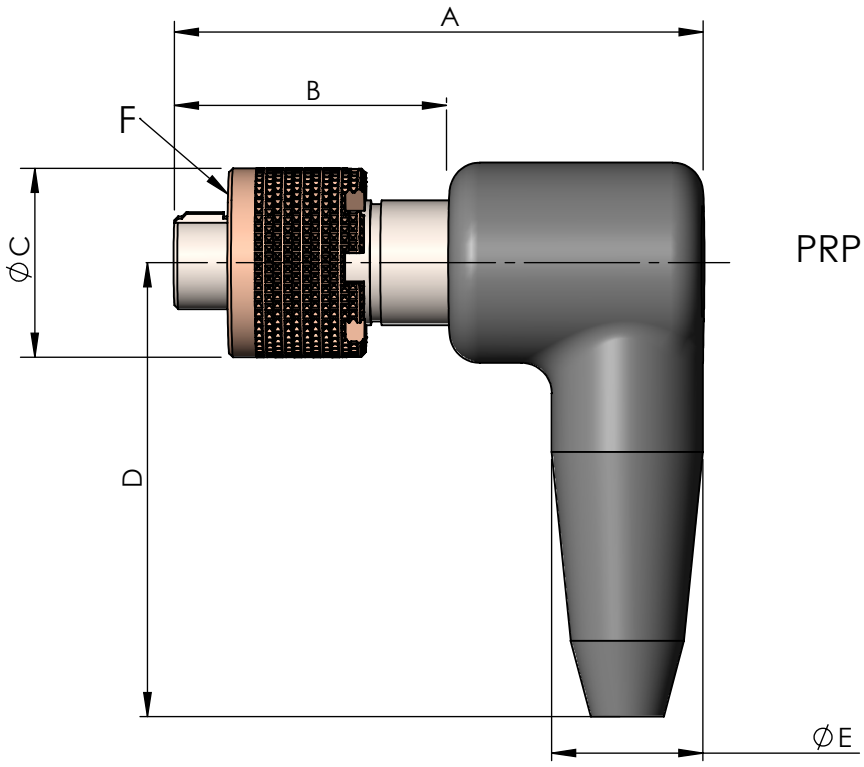
Reference Dimensions 'P' Connector

Moulded Cable Connector Receptacle-Straight



A	B	C	D	E-'O'Ring
96.25	36.5	28	28	16.76 x 1.63

Moulded Cable Connector Receptacle-90°



A	B	C	D	E	F-'O'Ring
75.5	36.5	28	55	25	16.76 x 1.63

Mould Sizes Are Indicative

Note: Step files for design purposes available from engineering@CRE-marine.com

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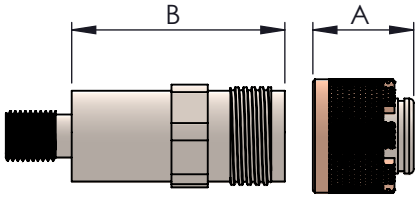
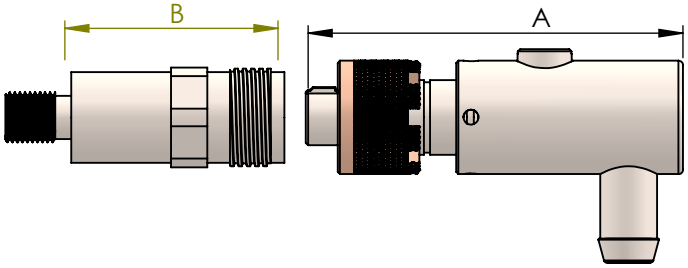
Underwater Connectivity

Assembled Dimensions 'P' Connector



PLPBC

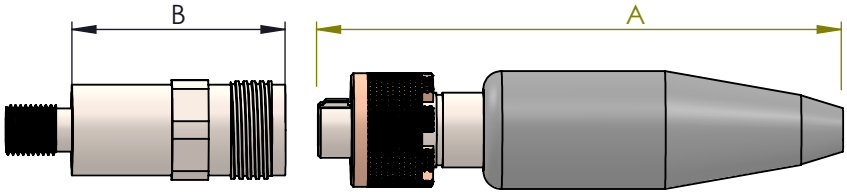
Assembled Dimension = 'B' + 9mm



PRPOF01

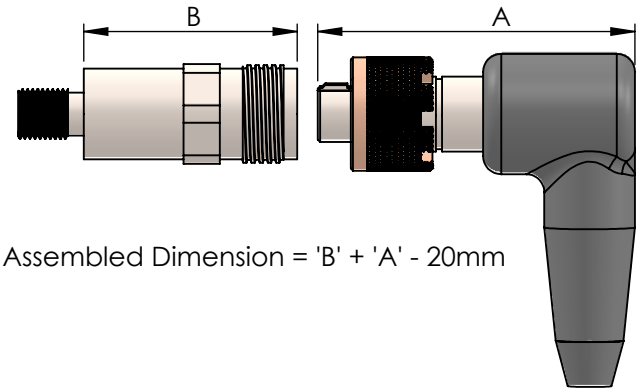
Assembled Dimension = 'B' + 'A' - 20mm

THREADED BULKHEADS
BRP01 - BRP07



PLP

Assembled Dimension = 'B' + 'A' - 20mm



PRP

Assembled Dimension = 'B' + 'A' - 20mm

EXAMPLE: BRP01 'B' = 52, PRPOF01 'A' = 79.5
THEREFORE ASSEMBLED DIMENSION IS 52 + 79.5 - 20 = 111.5

Mould Sizes Are Indicative

Note: Step files for design purposes available from engineering@CRE-marine.com

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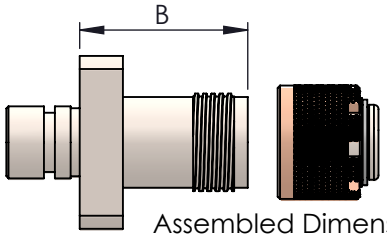
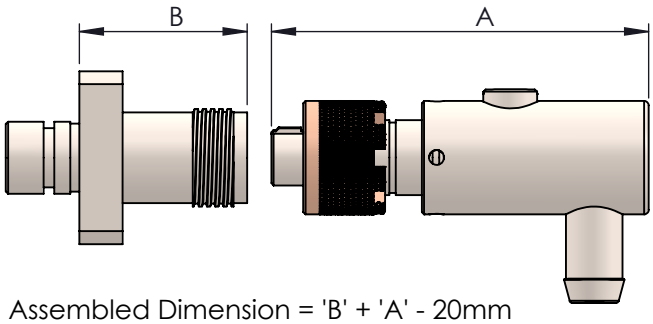
Underwater Connectivity

Assembled Dimensions 'P' Connector



PLPBC

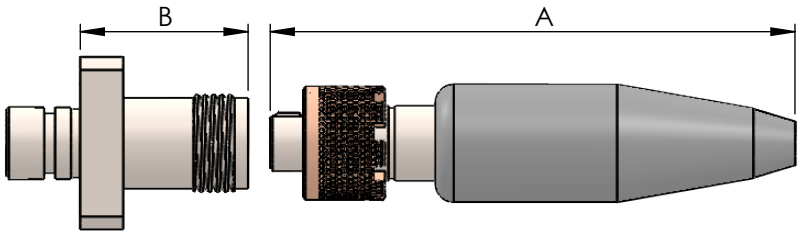
Assembled Dimension = 'B' + 9mm



PRPOF01

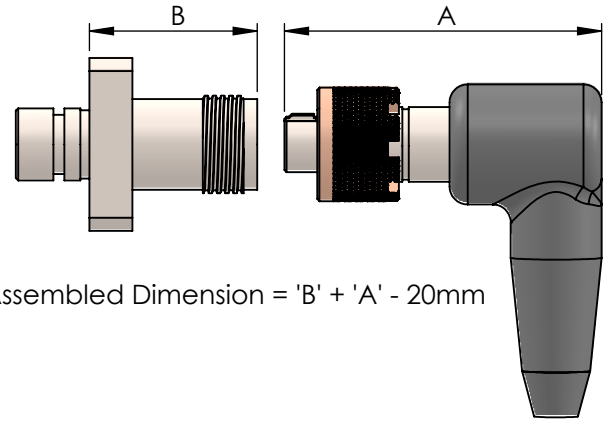
Assembled Dimension = 'B' + 'A' - 20mm

FLANGED BULKHEADS
FRP01 - FRP05



PLP

Assembled Dimension = 'B' + 'A' - 20mm



PRP

Assembled Dimension = 'B' + 'A' - 20mm

EXAMPLE: FRP01 'B' = 30, PRPOF01 'A' = 79.5
THEREFORE ASSEMBLED DIMENSION IS 30 + 79.5 - 20 = 89.5

Mould Sizes Are Indicative
Note: Step files for design purposes available from engineering@CRE-marine.com

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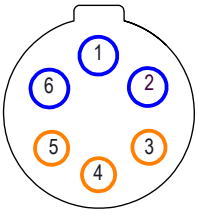
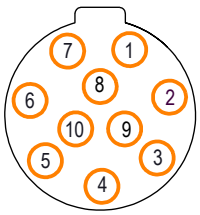
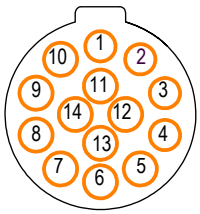
Pin Face View



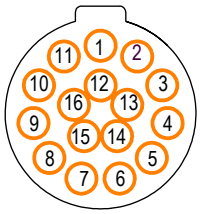
6 WAY
600 VDC



10 WAY
600 VDC

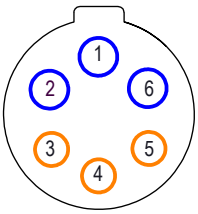


14 WAY
600 VDC

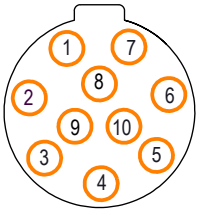


16 WAY
600 VDC

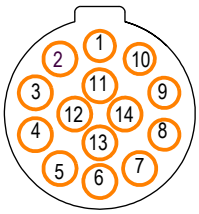
Socket Face View



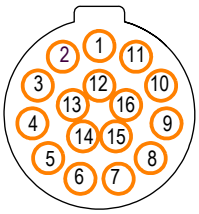
6 WAY
600 VDC



10 WAY
600 VDC



14 WAY
600 VDC



16 WAY
600 VDC

1 mm Pin

1.9 mm Pin

For current carrying capacity and wire recommendations see page 15

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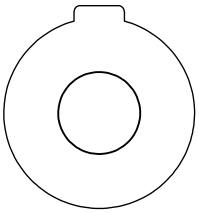
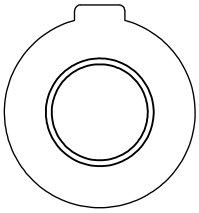
Pin Face View



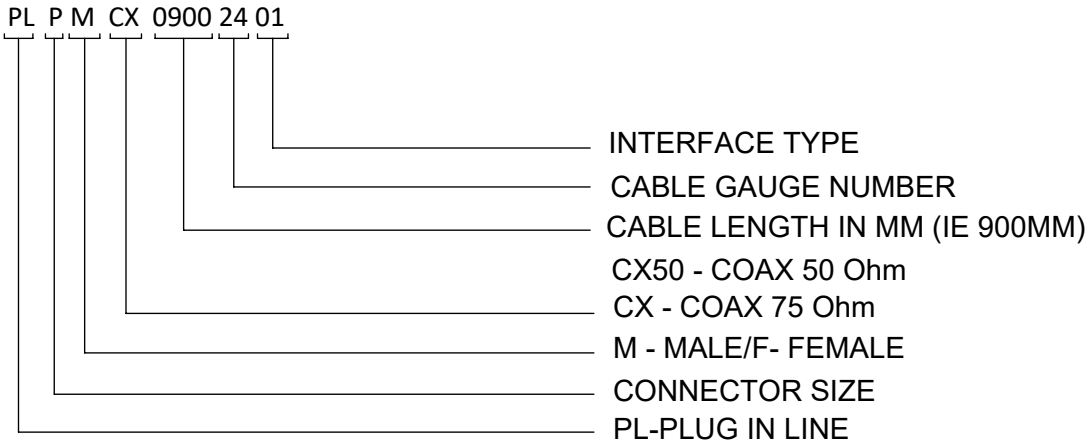
COAX
600 VDC

Socket Face View

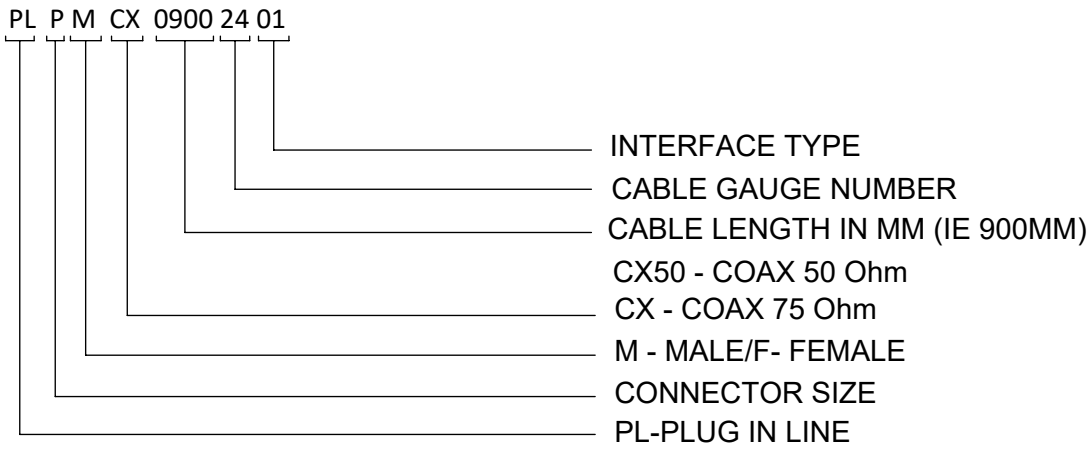


COAX
600 VDC

Part Numbering System-Bulkhead Example



Part Numbering System-Connector Example



For current carrying capacity and wire recommendations see page 15

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Underwater Connectivity

Current Capacity and Wire Recommendations

- The wire options for bulkheads are governed by the through bore of the bulkhead body and the dimensions of the solder bucket on the contact.
- Heat, caused by an electrical current flowing through a conductor will determine the amount of current that the wire will handle.
- The current rating follows industry standards for a single wire in free air at 30 deg. C with derating for bundled wires.
- The table below shows the current required to raise the temperature of a single insulated conductor to the limits of its insulation temperature.

Contact dia.	**1.0**	**1.9**
Wire size	22 awg	14 awg
Current	11 amps	40 amps
Contact rating based on PTFE type C cable		

Derating Factors for Bundled Conductors	
Bundle #	Derating Factor (x Amps)
2 - 5	0.8
6 - 15	0.7
16 - 30	0.5

Recommended torque for threaded intefaces manufactured in 316L Stainless Steel assembled into metallic housings.

Thread	**Torque N/m (Lubricated)**	**Torque Inch Pounds (Lubricated)**
7/16-20 UNF	3-4	30-35
1/2-20 UNF	4-6	40-45
9/16-18 UNF	5-7	50-55
5/8-18 UNF	5-7	50-55
3/4-16 UNF	7-9	60-65
7/8-14 UNF	8-10	75-80

The table above shows the recommended tightening torque values for threaded bulkhead interfaces into metallic housings.
We recommend the use of a small quantity of anti-seize lubricant such as Copaslip applied to the pin thread as a lubricant to aid the make-up process.
Should you require any further information or advice please contact CRE direct on sales@cre-marine.com